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Understanding the Knowledge and Practices of Mathematics Teacher Educators Who Focus on Developing Teachers' Equitable Mathematics Pedagogy

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Date of publication: October 24th, 2012

To cite this article: McLeman, L., & Vomvoridi-Ivanovic, E. (2012). Understanding the Knowledge and Practices of Mathematics Teacher Educators Who Focus on Developing Teachers' Equitable Mathematics Pedagogy. *Journal of Research in Mathematics Education*, 1 (3), 278-300. doi: <http://doi.dx.org/10.4471/redimat.2012.15>

To link this article: <http://dx.doi.org/10.4471/redimat.2012.15>

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Understanding the Knowledge and Practices of Mathematics Teacher Educators Who Focus on Developing Teachers' Equitable Mathematics Pedagogy

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Abstract

Most mathematics teacher educators (MTEs) would agree that teachers must be prepared to provide equitable mathematics instruction to all their students. However, to date, there is not a wide database regarding the practice of MTEs who play an integral role in this preparation. In this paper we argue that additional information is needed about the approaches in which MTEs have addressed or incorporated equity issues such as race, identity, language, and culture as a core part of the preparation of teachers. We further argue for the importance of developing a research agenda that examines the practices of MTEs who teach through this lens of equity, the goal of which would be to build models of professional development that prepare and support other MTEs to develop this specialized knowledge.

Keywords: mathematics teacher educators, practice, equity, research.

Comprender el Conocimiento y las Prácticas del Profesorado de Matemáticas Centrado en el Desarrollo de una Enseñanza Equitativa de las Matemáticas

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Resumen

Muchos maestros/as de matemáticas (MTEs) estarían de acuerdo que el profesorado tiene que estar preparado para proveer una instrucción matemática equitativa para todos los estudiantes. Sin embargo, hasta la fecha, no hay una base de datos amplia referente a prácticas del profesorado que juega un papel integral en su preparación. En este artículo sostenemos que se necesita más información sobre los enfoques que el profesorado ha utilizado para abordar o incorporar temas de equidad tales como la raza, la identidad, el idioma, o la cultura en el núcleo de sus formación como maestros/as. Reclamamos la importancia de desarrollar una agenda de investigación que examine las prácticas del profesorado que enseña a través del enfoque de la equidad, con el objetivo de construir modelos de desarrollo profesional para preparar y apoyar otros maestros y maestras para desarrollar este conocimiento especializado.

Palabras Clave: profesorado de matemáticas, prácticas, equidad, investigación.

Over the past two decades, the field of mathematics education has paid considerable attention to understanding and confronting differential mathematics achievement (DiME, 2007).

The nature of this attention has been on issues of race, class, gender, language, culture, and power in mathematics education and on how to promote achievement among culturally, linguistically, and socioeconomically diverse students. Researchers have described the knowledge and skills necessary to teach in this manner (e.g. Gay, 2009; Gutiérrez, 2009; White, 2002), specifically arguing that learning to teach mathematics for equity should be central to the teacher preparation curriculum.

Several mathematics teacher educators (MTEs¹) have described their approaches to preparing teachers to incorporate equitable instructional strategies that focus on issues such as race, identity, language, and culture within mathematics (e.g., Aguirre, 2009; Bartell, 2010; Chval & Pinnow, 2010; Drake & Norton-Meier, 2007; Dunn, 2005; Gutiérrez, 2009; Kitchen, 2005; Turner et al., 2012; Vomvoridi-Ivanovic, 2012). However, there is a need for more dialogue regarding the instructional practices of MTEs (Strutchens et al., 2012). In this paper, we echo this call by arguing for an increased public dissemination about the approaches in which MTEs have addressed issues of equity such as race, identity, language, and culture as a core part of the preparation of teachers. Moreover, we further argue for the development of a research agenda that focuses on learning from and about how to develop these practices.

To support our argument, we first share parts of our personal narratives and explain why we have chosen to use the term equity to frame our position. We continue by discussing findings from relevant literature, sharing what MTEs have argued are some necessary instructional practices and possible challenges when preparing teachers to develop equitable mathematical pedagogy. Through this discussion we demonstrate the need for further dissemination on how issues of equity are integrated into mathematics teacher preparation. We conclude by calling for the development of a research agenda and offering recommendations for future research.

We acknowledge that the practice of MTEs is ever changing and

and that we have not identified all such complexities. Nevertheless, our intent is to promote a dialogue that encourages MTEs to share and discuss the elements of their practice that focus on issues of equity.

Further, we wish to initiate a discussion about areas of research within the field of mathematics teacher education for the purposes of working toward the development of a framework of MTEs' knowledge base for teaching through a lens of equity. It is through the identification of and examination of current practices that we can begin to build models of professional development that prepare and support other MTEs to develop this specialized knowledge.

Our Positionality

What we as researchers attend to in our work, including the questions we ask and the interpretations we draw, is shaped by our own knowledge and background, among other things. However, sharing how we are situated within our work is not a widely held practice in mathematics education (Foote & Bartell, 2011). Foote and Bartell argue that doing so will enrich and impact how audiences receive our work. With this consideration, we share what motivated our desire to understand how MTEs integrate issues of equity into their instructional practice with the goal of providing anecdotal evidence that supports our call for dissemination and research.

Each of our educational journeys has led us to question how mathematics instruction is equitably provided to all students. The beginning of Laura's journey occurred while she was a secondary school mathematics teacher in a low-income, urban area with African-American students whose lived realities were very different from her own. Eugenia's journey began at an early age when she wondered why some of her classmates in Greece succeeded in mathematics, while others fell through the cracks. Her journey continued when as a mathematics teacher in the United States she wondered if race played a factor in who was placed in advanced mathematics courses and who was placed in remedial ones. As we progressed through these phases of our lives, we both saw that our methods of teaching (generally a mix of teacher-centered lectures and cooperative learning activities) did not help all of our students succeed. We realized that something more than just applying generically "good" teaching strategies was needed, but we

did not know what.

Our journeys led us to pursue doctorates in education, where we were Fellows in the Center for the Mathematics Education of Latinos/as (CEMELA²) and acquired knowledge, theories, and frameworks related to equity and diverse populations. After receiving our degrees, we each took positions in universities where we prepare teachers to teach mathematics in a way that not only draws on their students' lives, but also uses the students' lives as a basis to critique the world. However, we could not find published research regarding established models of practice or curriculum that we could use to frame our teaching. As we pondered the lack of research on the various ways that MTEs integrated issues of equity into their practice, several questions arose. How do MTEs teach their courses in a manner that does not unwittingly promote or reinforce deficit views of certain populations of students? What is the knowledge base of those MTEs? How can more MTEs develop the knowledge and disposition to make issues of equity such as race, identity, language, and culture central to their work? Discovering answers for these types of questions in order to improve the preparation of MTEs, mathematics teachers, and ultimately students in mathematics classrooms is what motivates our work.

What Do We Mean by “Equity?”

In recent years there has been an increased attention on providing equitable mathematics instruction to all students (Hart, 2003). For example, the National Council of Teachers of Mathematics (NCTM, 2000) identified equity as one of its core principles. In particular, they argued that equity requires schools and teachers to set high expectations and provide the necessary resources and support for all students to achieve, while acknowledging and accommodating the inherent differences that exist among learners (NCTM, 2000). Although NCTM's definition of equity does not focus on the sociopolitical context in which teaching occurs and does not offer specific approaches in which to achieve equitable instruction (Kitchen, 2005), it does frame the teaching of mathematics in a way that is accessible to many different individuals associated with mathematics education (e.g. teachers³, administrators, policy-makers). Therefore, we have deliberately chosen to use the term equity, even though there has been a shift among researchers to move

away from this terminology (Burton, 2003). We posit that our choice to use the term equity, as opposed to other terms such as *social justice* or *culturally responsive teaching*, makes our work more accessible to a broader range of individuals. For example, an MTE who focuses on issues of language and culture might identify more with the construct of culturally responsive teaching rather than that of social justice. An MTE who focuses on using mathematics as a tool to take action upon social inequalities, however, might identify more with the construct of social justice. Yet we assume that both MTEs would agree that their work prepares teachers to develop equitable mathematics pedagogy.

As with any broad idea, equity can mean different things and be used in different ways. Indeed, many scholars have presented varied definitions of equity (e.g., Aguirre, 2009; Crockett & Buckley, 2009; Gutiérrez, 2002; 2009; Secada, 1989). We take the stance of Gutstein et al. (2005) that the existence of different definitions for equity is not inherently problematic, as certain definitions can serve specific purposes. However, to make clear how we conceive of equity, we view it in a way similar to Gutiérrez (2002). We see equity as an inclusive construct in which characteristics such as race, class, gender, language, culture and/or sexual orientation should not determine the level of mathematics achievement that one attains. Further, as others have argued (e.g., Bartell, 2011; Crockett & Buckley, 2009; Gay, 2009; Matthews, 2003), we believe that these characteristics should be an integral part of the mathematics curriculum so that students can use mathematics to “examine one’s own lives and other’s lives in relationship to sociopolitical and cultural-historical contexts” (Gutstein, 2006, p. 5).

Why "Equity"?

Mathematics has acted as a “Gate-Keeper” and is not something that is available for all students (Bishop & Forgasz, 2007; Silva, Moses, Rivers, & Johnson, 1990; Stinson, 2004). Students of color, low-income students, and language minority students have received a subpar mathematics education, as their mathematics instruction has been disproportionately focused on acquiring rote memorization of formulas and facts instead of on a deep and flexible understanding of concepts (Becker & Perl, 2003; Leonard, 2007; Oakes, 2005). While there is a growing body of research on equitable mathematics education (e.g.,

Adler, 2001; Apple, 1992; D'Ambrosio, 1985; Fennema & Sherman, 1977; Gutiérrez, 2002; Povey, 2002; Secada, 1989; Setati, 2005; Zevenbergen, 2000) much of this work has focused on the pre-collegiate level. This is understandable considering the ultimate goal is to affect positive change in the outcomes of K-12 students' mathematics learning and achievement.

In comparison, little emphasis has been placed on research regarding the preparation of mathematics teachers to focus on issues of equity. Although studies at the general teacher education level have examined teachers' beliefs/attitudes/values toward teaching for equity (Hollins & Guzman, 2005), we know very little about mathematics teacher preparation in particular. Moreover, as is the case in general teacher education (Zeichner, 2005), even less is known about the practices of MTEs who prepare teachers to teach for equity. Most of the research on MTEs' practices is comprised of small-scale self-studies and/or reflections on practice (e.g., Bartell, 2011; Bonner, 2010; Kitchen, 2005). Even then, this literature focuses mainly on teachers' learning through the MTEs' practices as opposed to how the MTEs themselves acquired and developed the knowledge, skills, and dispositions to enact these practices.

Recommendations for research have called for a better understanding of the role that mathematics teacher education programs play in preparing teachers to teach mathematics for equity (Gutstein et al., 2005). We posit that in order to develop this understanding, MTEs who teach through a lens of equity must disseminate elements of their instructional practices. It is likely that in addition to what has already published, others have and are attempting this work but have not made their experiences public. With an increased attention placed on the practices of MTEs, the field can develop theories about best approaches to engage in this work. Moreover, all MTEs might begin to recognize the importance of helping teachers understand the inherent inequities that might take place when teaching mathematics.

What Do We Know?

While there has not been a systematic, broad scale, examination of the population of MTEs who frame their work through equity, some MTEs have reflected on their personal experience of infusing equity into their

courses or have undertaken small-scale studies to examine teachers' learning. To gain an understanding of what literature existed, we first looked to the work of prominent researchers whose work we already knew centered on issues of equitable mathematics teacher instruction. Next we searched databases such as ERIC and websites such as Google Scholar to find literature (e.g., journal articles, conference presentations, books) that focused on equity within mathematics teacher education. For any sources we identified, we also examined the references that were cited in order to broaden our literature base.

An examination of this literature provides insight regarding two overarching themes: (1) necessary components of MTEs' instructional practice and (2) challenges that MTEs may face when preparing teachers to develop equitable mathematical pedagogy.

Theme 1: Necessary Components of MTEs' Instructional Practice

Building relationships with students. A number of MTEs, such as Gutiérrez (2009) and Kitchen (2005), have shared their desire to help teachers become advocates for their students. This advocacy can only be developed, though, through the creation of a respectful and trusting community of learners (Gay, 2009). Kitchen shares how he starts each semester with his students by discussing his personal narrative and why this work is meaningful to him. Kitchen also details how he makes a conscious effort at the start of every class to help his preservice teachers acquire concrete methods of teaching. Kitchen argues that by situating himself within his teaching and by attending to his students' most immediate needs of learning about specific strategies to teach mathematics, preservice teachers will then be willing to engage in activities that challenge their perceptions and thinking about the world.

Examining activities from others' perspectives. Some researchers (e.g., Bonner, 2011; Drake & Norton-Meier, 2007; Gutiérrez, 2009) have addressed the preparation of teachers to develop equitable mathematics pedagogy by challenging their students to examine mathematical activities through the perspective of others. Stocker and Wagner (2007) share the importance of allowing teachers who participate in a "culture of power" (Delpit, 2006, p. 24) to experience the viewpoint of some underserved and underrepresented students. Oftentimes, these opportunities are presented in the form of field experiences that have

preservice teachers focus on issues of equity such as observing which students have a “voice” in the classroom (e.g. Bonner, 2011; Drake & Norton-Meier, 2007). Some researchers (e.g. Gallego, 2001) have argued that to be meaningful, though, such field experiences need to occur in settings that reflect student diversity and must not perpetuate teachers’ misconceptions, stereotypes, and assumptions about various groups of students. Instead, the experiences need to occur in settings that model the ideals proposed in teacher education coursework (White, 2002). Doing so supports the need for teachers to explore the mathematical knowledge of a variety of students, to learn how to select and utilize mathematics tasks that draw on students’ experiences, and to interact and work with individuals who are culturally different from themselves (White, 2002; Vomvoridi-Ivanovic, 2012).

Engaging teachers in critical reflection. Other mathematics educators (e.g. Dunn, 2005; Kitchen, 2005; Rousseau & Tate, 2003) have argued that critical reflection also needs to play an important part in teachers’ preparation. Critically reflecting on issues of equity in mathematics, which Rousseau and Tate argue is absent from mainstream mathematics education, involves having teachers consider social, political, and cultural contexts while they examine their assumptions, beliefs, and values about mathematics teaching and learning. Over a span of four years, Dunn found that by engaging teachers in critical reflection in her mathematics methods courses some teachers transformed their view about the mathematics education of underserved and underrepresented students. For example, one teacher shared her amazement at what different students could achieve when they had ownership of the classroom. Further the teacher revealed that students with various backgrounds know and can do mathematics. The challenge for MTEs then is to help teachers continually critique and reflect on their views and attitudes about who can achieve and participate (Kitchen, 2005).

Equity as a central component of instructional practice. A final component of the necessary components of instructional practice discussed in the literature is the incorporation of equity issues as a central focus throughout the curriculum. Specifically, researchers have argued that MTEs should model through their own instruction how equity can be woven throughout their instruction (Bonner, 2011; Gay,

2009) while also providing opportunities for teachers to grapple with this integration as well (Bartell, 2011; Bonner, 2010). This is an important consideration, as some issues of equity do not occur outside the realm of teaching mathematics; rather they occur within the context of mathematics teaching and learning (Crockett & Buckley, 2009). For example, debating mathematical ideas with peers is a discourse practice that is valued in reform classrooms. However this form of discourse may not be aligned with the norms of some cultures. For example, in many Native American tribes non-verbal communication is a highly valued skill. Additionally, many children are taught to intently listen and observe until they feel they are prepared to participate or until they feel there is a real-world practical application (Grant & Gillespie, 1993). MTEs need to be mindful of such issues in their own instructional practice and provide opportunities for teachers to grapple with similar issues as well.

While the literature points to some elements of an MTE's instructional practice that are necessary for preparing teachers to develop equitable mathematics pedagogy, it also elucidates some challenges that MTEs may face when doing so.

Theme 2: Challenges that MTEs May Face

Finding the balance between mathematical and equity concepts. Some researchers (e.g., Aguirre, 2009; Bartell, 2011; Stocker & Wagner, 2007) have discussed the challenges they or other mathematics teachers have faced when trying to balance the focus on mathematical content with the focus on equity. Gutiérrez (2009) acknowledges this tension of how to “cover” mathematics content while also addressing issues of equity by arguing that teachers should embrace the notion that they teach much more than mathematics. Instead, Gutiérrez argues, teachers first and foremost teach students, and at times it is important to focus on issues that do not seem to directly relate to mathematical concepts. As Aguirre notes, the issue becomes which of equity or mathematics takes precedent and when.

Lack of formal equity education. Another challenge facing MTEs is the lack of formal preparation in making equity a priority in instruction (Taylor & Kitchen, 2008; Zaslavsky & Leikin, 2004). In their recommendations for integrating issues of diversity and equity in

doctoral programs in mathematics education, Taylor and Kitchen share how large numbers of U.S. doctoral students exit their programs and take positions in institutions around the world with limited to no experience in examining issues of equity. In addition to this lack of formal preparation, there also exists a lack of formal professional development experiences to help MTEs integrate issues of equity into their instructional practice (Zaslavsky & Leikin, 2004). Indeed we could find only the “Teachers Empowered to Advance Change in Mathematics” (TEACH) project that specifically focuses on the development of instructional modules for MTEs to prepare teachers to teach mathematics for equity (Turner et al., 2012). This dearth of relevant preparation and support speaks to the under-preparedness of many colleagues to meaningfully include issues such as race, language, identity, or culture within their mathematics teacher preparation courses.

Teacher resistance. In detailing some of the challenges they face, some MTEs (e.g., Aguirre, 2009; Drake & Norton-Meir, 2007; Ensign, 2005) discuss the issue of teacher resistance. One type of resistance that MTEs may face from the teachers with which they work is similar to the resistance mathematics teachers face from students, parents, and/or administrators when they attempt to integrate issues of equity in the mathematic curriculum. Specifically, students (or parents/administrators) may perceive the mathematics in students’ lives as not constituting “real” mathematics since it might not align with the mathematical knowledge found in textbooks (Ensign, 2005). Similarly, as Aguirre (2009) notes, teachers as well as other members of the mathematics education community might not feel that teaching through a lens of equity is “mathematical” enough. She further draws on Rodríguez’ (2005) notions of resistance to ideological and pedagogical change to describe mathematics teachers’ resistance to teaching through the lens of equity. Ideological resistance (RIC) refers to teachers’ reluctance to change their beliefs and values, while pedagogical resistance (RPC) refers to teachers’ reluctance to embrace instructional practices that differ from their experiences. Specific to the preparation of teachers for mathematics through a lens of equity, Aguirre shares her experiences with some teachers holding on to cultural deficit models (RIC) while others were skeptical about teaching mathematics through a lens of equity with young children (RPC).

Another type of resistance focuses on the cultural background of both MTEs and their students. At times, an MTE may be part of the dominant culture while the preservice teachers in the class are not. In this situation, the MTE's credibility to address issues such as race and identity within the mathematics classroom, as well as the MTEs' membership in the dominant culture, may be challenged. Howard (2006) describes how this resistance can manifest if individuals do not confront the elements of dominance that are ingrained in their actions and perceptions. This then may result in another form of resistance to an MTE's instructional practice of helping teachers develop equitable mathematics pedagogy, namely when the students in an MTE's classroom are part of the dominant culture. As Landsman (2011) shares, white teachers can be willing to examine biases present in curriculum or against students and parents. Yet, even with this willingness, they might still be resistant to examine how they are afforded advantages in the world based on the way they look.

While resistance based on cultural, pedagogical, or ideological differences is to be expected and at times may be encouraged, it has the potential to develop into an adverse learning environment. One consequence of this is that MTEs may receive negative course evaluations, which may act as a deterrent for some MTEs. Indeed, Aguirre (2009) shares how her focus on equity in her mathematics methods courses has at times resulted in course evaluations that were less than favorable. While Aguirre did not let these evaluations dissuade her from teaching in a manner that was so much a part of her identity, other MTEs, especially tenure-track faculty, may be reluctant to risk the possibility of receiving negative feedback from students. Since course evaluations are a large part of most, if not all, tenure files, this fear is understandable.

Next Steps

A Call for Public Dissemination

Even though we know some about the instructional practices of MTEs and the possible challenges they may face when teaching through a lens of equity, there are many elements of this practice that remain elusive especially to those MTEs who are new to this line of work. For example, how do MTEs work with the teacher resistance they may face

when integrating issues such as race within their instruction? How do they negotiate the tensions that may arise in classroom discussions about testing biases against African-American students?

More information is needed about approaches in which MTEs have addressed issues of equity such as race, identity, language, and culture as a core part of the preparation of mathematics teacher educators. In addition to work that has been published in this area, it is likely that others have attempted to tackle this issue but have not made their experiences public. However, it is only through a public dissemination of experience that the field can begin to develop theories about best approaches to prepare teachers to develop equitable mathematics pedagogy. These theories will then allow other MTEs to develop an understanding about how to enact their own instructional practice centered on equity. Moreover, these theories will continue to bring the issue of equity to the forefront of mathematics education, an important consideration if all MTEs are to begin to recognize the importance of helping teachers understand the inherent inequities that might take place when teaching mathematics.

The Development of a Research Agenda

With the field of mathematical education only beginning to recognize the importance of investigating MTEs' impact in mathematics teacher education (Jaworski, 2008), an increased attention to the practice of MTEs who focus on issues of equity will also help the field of mathematics education begin to develop a research agenda around this area. Such a systematic examination does not currently exist on a broad scale (Gutstein et al., 2005) and will contribute to building of models of professional development that prepare and support other MTEs to develop this specialized knowledge. Since MTEs play an important role in mathematics teacher education programs, an explicit focus should be placed on researching those MTEs who teach through a lens of equity.

There are a myriad of potential lines of inquiry to pursue. In the following sections, some possibilities are shared. At times, specific questions/ideas are shared; other times, some general areas that are worthy of consideration are discussed. By no means is this section meant to be comprehensive; rather it is intended to serve as a starting point to promote further discussion and examination.

Who is Doing This Teaching and What and How are They Teaching?

As discussed earlier, the available information on the topic of equity and mathematics teacher education has typically been documented in published self-studies and self-reflections. As a result, only what these individuals have chosen to share about themselves and their individual practice is known. What is further needed is a broad scale understanding of what Gutiérrez (2002) called the “core characteristics” (p. 175) of this population of MTEs. This would include investigating their knowledge, lived experiences, beliefs, attitudes, values, and dispositions, among other things. An understanding of these core characteristics will support the need to develop a working model of MTEs’ knowledge base for teaching through a lens of equity.

There is also the need to develop a greater understanding of the instructional practices of MTEs who teach through a lens of equity across geographic (urban, suburban, rural), departmental (mathematics, education), and grade level (elementary, secondary) contexts. This would entail analyzing the curricular choices of these MTEs and determining how they model what they advocate in their instructional practice (Zeichner, 2005). Moreover, a critical examination of the role that MTEs may play when they encounter teacher resistance is needed. While it may be pointless to try to determine causality of why resistance occurs, it is important to consider how an instructor’s actions might unknowingly prompt resistance to occur.

Each of these areas alone is worthy of investigation. Yet it will not suffice to simply examine them independently of each other; we must understand how each impacts the other. Some specific questions that would attend to deepening this understanding include:

1. How do MTEs’ beliefs, knowledge (be it mathematical, linguistic, and/or cultural) and backgrounds influence their curricular choices and how they are enacted in the classrooms (Zeichner, 2005)?
2. How do MTEs draw upon their resources (e.g. their lived experiences, their knowledge) when they teach mathematics through an equity lens (Gutiérrez, 2005)?
3. How might MTEs’ teaching practices impede teachers’ abilities to teach mathematics for equity (Dunn, 2005)?

Another important component of how MTEs teach with a focus on equity is the support the MTEs do or do not draw upon. Therefore, an investigation into the support that they need (regardless of whether it exists or not) is also critical. In particular, in light of some of the possible challenges that exist for MTEs of color and other members of underserved and underrepresented populations to teach mathematics with an equity focus, explicit attention must be paid to the current support structures for this population of MTEs.

Finally, previous calls for research have indicated a need to understand the preparation of teachers to teach mathematics to those students whose home language is different from the official language used in schooling (e.g., Lucas & Grinberg, 2008; Zeichner, 2005) as well as the preparation of mathematics teachers of color (e.g., Villegas & Davis, 2002; Vomvoridi-Ivanovic, 2012). This focus on mathematics teacher preparation would necessarily include the active participation of MTEs. Thus, there is a need then to understand better the population of MTEs who specifically attend to these areas in their work.

How Might We Increase This Focus on Equity?

To make teaching mathematics through a lens of equity a priority in all teacher education programs around the globe, we need to look beyond the existing population of MTEs who are doing this work (or have the propensity to do so). Instead, we need to examine how MTEs in general can develop the needed dispositions/beliefs and/or acquire the necessary knowledge. Is it, as Aguirre (2009) or Taylor and Kitchen (2008) proposed, through doctoral programs of studies? Or is it rather through, or in conjunction with, ongoing MTE professional development that involves collaboration among multiple members of the community of mathematics education as discussed by Zaslavsky and Leikin (2004)?

We also need to look beyond methods courses and student teaching practicum to investigate how other faculty associated with the preparation of mathematics teachers can or do teach mathematics content for equity. For example, what does it mean to teach a content course through an equity lens? Researchers such as Felton, Simic-Muller, and Menéndez (2012) have begun to examine the challenges and successes involved with teaching mathematics to K-8 preservice teachers through a sociopolitical lens. We further ask what moves could

a mathematician make to teach Calculus 1 or Linear Algebra (required courses for many secondary mathematics teachers) through an equity lens? What mechanisms must be in place in order to support those individuals who wish to teach these content courses in such a manner? How might they develop the skills, knowledge, and dispositions to do so?

Conclusion

In this paper we have presented an argument for the necessity of expanding the public dissemination of practices that focus on integrating issues of equity into mathematics teacher education and for developing a research agenda around these practices. In particular, we discussed how research on mathematics teacher preparation has not addressed the population of MTEs as important roles in preparing teachers to teach mathematics through this lens. We further shared how current literature has informed the field about some of the necessary components of MTEs' practice and the challenges that accompany this practice.

Through this call for an increased public dissemination and the development of a research agenda, we hope to expand the discussion on preparing teachers to teach diverse students by focusing explicitly on the MTEs who are involved in this preparation. In order to make equity a priority in mathematics education, we need to move beyond the examination of mathematics teachers and learners. We need to also critically examine the population of MTEs who prepare teachers to teach through a lens of equity.

Notes

¹ Jaworski (2008) defines MTEs as "professionals who work with practicing teachers and/or prospective teachers to develop and improve the teaching of mathematics" (p. 1). For us, this includes all levels of faculty (tenure-track, tenured, graduate students, and adjuncts) in undergraduate and graduate mathematics teacher preparation programs.

² CEMELA is a Center for Learning and Teaching supported by the National Science Foundation, grant number ESI-0424983. Any opinions, findings, and conclusions or recommendations expressed in this document are those of the authors and do not necessarily reflect the views of the National Science Foundation.

³ We use the term *teachers* to refer to both practicing teachers of mathematics and those individuals who are preparing to become mathematics teachers.

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